

(19)



Europäisches  
European Patent  
Office européen des brevets



(11)

EP 0 753 637 B1

(12)

**EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention  
of the grant of the patent:  
**05.04.2000 Bulletin 2000/14**

(51) Int Cl.<sup>7</sup>: **E05D 15/06**

(21) Application number: **95500147.4**

(22) Date of filing: **30.10.1995**

**(54) Structure for the assembly of sliding doors**

Struktur zum Anordnen von Schiebetüren

Structure pour l'assemblage des portes coulissantes

(84) Designated Contracting States:  
**AT BE CH DE DK FR GB GR IE IT LI LU MC NL PT  
SE**

Designated Extension States:  
**LT LV SI**

(30) Priority: **13.07.1995 ES 9501409**

(43) Date of publication of application:  
**15.01.1997 Bulletin 1997/03**

(73) Proprietor: **KLEIN IBERICA, S.A.  
E-08024 Barcelona (ES)**

(72) Inventor: **Tarrega Lloret, Miguel Angel  
E-08024 Barcelona (ES)**

(74) Representative: **Hernandez Covarrubias, Arturo  
c/o Clarke, Modet & Co.,  
Avda. de los Encuertos 21  
28760 Tres Cantos (Madrid) (ES)**

(56) References cited:  
**EP-A- 0 181 444 EP-A- 0 502 285  
DE-B- 1 031 179**

**EP 0 753 637 B1**

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**Description**

[0001] This invention refers to a structure for the assembly of sliding doors, made up of at least an upper track on which the carriage from which the doors are suspended may travel, the doors being further coupled at their lower end on guides that prevent any rocking movements.

[0002] A structure of the type set out is described in ES-A-2 008 885, of the same applicants, in which the track is made up of a square section profile fitted along its lower wall with a central slot, limited by internal tracks on which the carriages run, whereas the opposite wall has a central alignment of countersunk holes and intermediate external longitudinal fins located between the central alignment of the holes and the longitudinal edges.

[0003] With this constitution, the heads of the screws used to fix the track must be of a size equal to or smaller than the countersinking practised on the aforementioned holes, so that said head does not protrude towards the inside of the track. To meet this condition the upper wall of the track must be thick enough to enable effecting deep enough countersunk holes or alternatively by drawing or by ensuring that the heads of the screws are not very high.

[0004] On the other hand, the supporting surface of the track upon the surface of the ceiling on which it is fixed is defined by the free longitudinal edge of the two intermediate external fins. Due to these fins being retracted in respect of the longitudinal walls of the track, the width of the support surface is reduced and with it the stability of said track.

[0005] According to the ES-A-2 008 885, the carriage includes a box shaped frame, of a relatively high cost, because of its manufacturing process.

[0006] There is already known in the prior art the EP-A-502285, which describe a mechanism for the mounting of sliding and folding doors, particularly doors consisting of at least two leaves, suspended by means of upper rail rolling elements and which run on lower guides. The upper rails consist of a shaped section that forms two rolling tracks for sliding doors and a single rolling track for folding doors, along which move groups of carriages belonging to different door leaves. The carriages making up the rolling elements have a vertical hole for taking a suspension rod for the leaves. The bottom of the leaves has runners that slide along an inverted guide, fitted below the level of the gap closed by the door.

[0007] The object of this invention is a structure of the type set out above, in which the track presents a constitution that would allow absorbing the heads of the screws without any risk of their protruding towards the inside of the channel and without requiring a greater thickness of the corresponding wall or the performance of drawing operations. Another object of the invention is to achieve a more stable track support base upon its

fixing surface.

[0008] In the structure subject of this invention the carriage frame is manufactured starting off a profile that may be obtained using traditional systems and that allows a reduction of the cost of the frame in respect of the traditional structures. Furthermore, the constitution of the carriage wheels allow their thoroughly silent and smooth displacement.

[0009] Pursuant to this invention, the tubular track of the structure has, on the wall opposite its open wall, an internal central longitudinal channel moulding that forms externally a protruding longitudinal portion. Holes to accommodate the fixing screws are practised on the bottom of this channel melding. The channel melding is internally sized so as to accommodate the heads of the screws.

[0010] With this constitution, the profile making up the track requires only the execution of the screw passage holes, given that the screw head housing is achieved through the previously described channel melding.

[0011] According to another characteristic of the invention, the upper wall or bottom of the track has two externally longitudinal wings that are located at either side of the protruding portion, as an extension of the adjacent walls. These wings have a height equal to that of the aforementioned protruding portion, so as to jointly define the track supporting surface. In this way a totally stable supporting base is achieved, upon being defined by both the central protruding portion and the longitudinal wings located at either side, which are furthermore separated by a distance equal to the width of the track.

[0012] The frame of the carriage that are housed and move inside the track is made up, pursuant to the invention, by an inverted U section profile on which bottom there is a central hole, coinciding with which it has, internally fitted, a hollow cylindrical member internally threaded so as to allow the passage of the screw from which the sliding doors are to be suspended. On either side of said hollow cylindrical member are fitted the wheels that will protrude through openings located on the bottom of the frame profile.

[0013] With this constitution, the frame is formed from a profile obtained using traditional systems, such as extrusion, in which it shall only be necessary to practice the openings and holes required to fit and assemble the various carriage components.

[0014] The carriage wheels may include axes fitted on their external surface with longitudinal grooves to store lubricant.

[0015] Furthermore each one of the carriage wheels may be made up of an external housing made of plastic material, a metal hollow cylindrical member coaxially fitted within the aforementioned housing and two aligned hollow cylindrical members that are fitted upon the axis of the wheel and are supported by their external ends against the walls of the frame, further having the two aligned hollow cylindrical members, starting off their adjacent edges, two conical offsets forming an intermedi-

ate furrow, across from which the stub end fixed to the frame has a further annular furrow, for the assembly of bearing balls between the two furrows.

[0016] Any of the above described constitutions of the carriage wheels will eliminate any possible wheel turning friction, so that door displacement may take place smoothly and silently.

[0017] The structure of the invention does furthermore simplify the intermediate door fastening elements and the roller retaining devices.

[0018] The characteristics of the structure of the invention, as set out in the claims thereof, as well as the advantages accrued therefrom, may be understood with greater ease using the description set out below, prepared in reference to the attached drawings, which show a possible way of execution, prepared as a non limitative example.

[0019] On the drawings:

[0020] Figure 1 is a schematic elevation view of a door manufactured pursuant to the invention, shown in the open position.

[0021] Figure 2 is an upper plan view of the door shown in figure 1.

[0022] Figure 3 is a plan view of a door of the type called "enclosed between walls", showing the position of the intermediate door fastening elements.

[0023] Figure 4 is a side view of the upper tubular track.

[0024] Figure 5 is an upper plan view of the tubular track shown in figure 4.

[0025] Figure 6 is a side elevation view of one of the carriage housed in the tubular track shown in figures 4 and 5.

[0026] Figure 7 is a longitudinal section view of the carriage, seen as per the VII-VII cutting line of figure 6.

[0027] Figure 8 is a view similar to that shown in figure 7, showing an execution variant.

[0028] Figure 9 is a side view of a suspension carriage with the intermediate door fastening element.

[0029] Figure 10 is an upper plan view of the intermediate fastening element included in figure 9.

[0030] Figure 11 is a view similar to that of figure 9, showing an execution variant of the door fastening intermediate element.

[0031] Figure 12 is a side view of the fastening element shown in figure 11.

[0032] Figures 13 and 14 are views similar to that of figure 9, showing, in different positions, an intermediate door fastening element.

[0033] Figure 15 is a side view of the fastening element of figures 13 and 14.

[0034] Figure 16 is a side elevation view of a carriage retaining element.

[0035] Figure 17 is a section view of the retaining element, seen as per the XVII-XVII cutting line of figure 16.

[0036] Figure 18 is an upper plan view of the lower door guiding device.

[0037] Figure 19 is a side cross-section view of the

guiding device, seen as per the XIX-XIX cutting line of figure 18.

[0038] The structure of the invention, as shown in figures 1 to 3, is made up of a hollow carrying track 1, inside which may travel carriages 2 from which are suspended, by way of the intermediate fastening elements 3, doors 4. The track 1 incorporates internally retaining devices 5 for carriages 2. The door 4 is guided at its lower end by a guiding device 6.

[0039] In figure 2 the sliding door 4 is attached to a wall or partition when in its open position, whereas in the example shown in figure 3 the door 4 remains at its open position housed between two walls.

[0040] As shown in figures 4 and 5, track 1 has a tubular configuration, with approximately rectangular sides and has on its lower horizontal branch a longitudinal slot 7 limited by sections 8 out of which internally protrude a longitudinal rim limiting a flat external raceway 9 that constitutes the rolling surface of the wheels 10 of the carriages 2.

[0041] The upper horizontal wall 11 of the profile has an internal trapezium shaped longitudinal channel moulding 12 that determines externally a protruding portion 13. Screw passage holes 14 are drilled on the bottom surface of channel moulding 12. Out of the upper wall 11 do also protrude side end longitudinal wings 15 acting as an extension of the longitudinal walls 16 of the profile, having the wings 15 a height approximately equal to the protruding longitudinal portion 13.

[0042] Through the holes 14 will pass the screws used to fix the track to the ceiling, being the channel moulding 12 sized so as to house the heads of the screws so used, without said heads protruding towards the inside of the track.

[0043] Track 1 shall lay against the surface of the ceiling on which it is fixed by way of the protruding portion 13 and the wings 15, defining between them the supporting surface or base, with a width equal to that of the profile, due to the wings 15 being an extension of the side walls 16 of said profile.

[0044] As may be observed in figures 6 and 7, the carriage 2 has a frame 17 made using a U section profile. This profile has at its bottom end a central hole 18 around which an internally threaded hollow cylindrical member 19 is internally fixed. On either side of the hollow cylindrical member 19 are arranged wheels 10 mounted so that they may turn around axis 20, which have on their external surface longitudinal grooves 21 used to store lubricant.

[0045] Figure 8 represents an execution variant, in which each of the wheels 10 is made up of an external housing 22 made of plastic material, of a metal hollow cylindrical member 23 coaxially fixed within the previously mentioned frame and by two aligned hollow cylindrical members 23 that support each other using their adjacent edges, whereas their external edges rest upon the carriage frame or profile walls. The two aligned hollow cylindrical members 24 have, as from their adjacent

edges, two conical offsets 25 that determine an intermediate furrow, across from which the hollow cylindrical member 23 has a further annular furrow, for the assembly of bearing balls 27 between the two furrows. The aligned hollow cylindrical members 24 are fitted upon axis 20.

[0046] The threaded hollow cylindrical member 19 of the carriages 2 is used to fasten screw 28 from which the sliding door 4 will be suspended, using the intermediate fastening element 29. In the cases of figures 9 and 10 this fastening element is made up by a bridging plate which at its central section has a slot 30 for the passage of the screw 28, which is attached using counternuts 31. At the end positions of this strip are made holes 32 for the passage of screws 33 to be fixed on the upper edge of the door.

[0047] Figures 11 and 12 represent a suspension element execution variant made up of a strip 34 bent to form an inverted L, that at its upper end has a slot 35 for the passage of screw 28. On the larger branch of this strip are drilled holes for the passage of screws 36 to be secured to the side surface of the door. The strip 34 does further include lugs 37 bent towards the concave side of the strip to be supported upon the upper edge of the door 4.

[0048] In the execution shown in figures 13 to 15 the intermediate fastening element is made up of a profile 38 partially closed at its opening and which cups around the upper edge of the door. Within this profile is housed a Z shaped part 39 which end branches 40 and 41 are parallel. Part 39 may travel inside the profile 38, resting the branch 40 upon the internal surface of the bottom of the profile, whereas the upper section or branch 41 rests upon the wings 42 that partially close said profile. This branch 41 is fitted with a hole for the passage of screw 28 that is fastened inside the hollow cylindrical member of carriage 2.

[0049] The profile 38 is fixed to the door using screws 43, which ends protrude with their head inside the profile to serve as the slide limiting tops of part 39, as shown in figures 13 and 14.

[0050] As may be better observed in figure 15, the head of the screw 28, polygonally contoured, remains tightly housed between the walls of profile 38, which prevents the screw from turning.

[0051] Figures 16 and 17 illustrate one of the retaining devices of carriages 2, made up of an inverted U shaped part 44, placed broadside and which side branches 45 run and rest perpendicularly upon raceway 9 of the track. These side branches have, starting off the end edge, notches 46 that may be housed upon the longitudinal ribs that protrude from raceways 9. The central branch of part 44 extends, from one of its sides, so as to form arm 47 directed towards the inside of the track 1, fitted to its bottom and featuring on its lower surface a curve-concave longitudinal notch 48 to receive one of the wheels of the adjacent carriage. The intermediate branch of part 44 has a central hole 49 in which fits tightly

5 a nut 50 on which is threaded a bolt 42 capable of resting its free end upon the bottom of the internal longitudinal channel forming 12 of track 1, thus remaining part 44 firmly fixed between the lower wings 8 and the bottom of the track.

[0052] Finally, the lower door guiding device 6, shown in figures 18 and 19, is made up of a part that includes a flat structured hollow central core 52, crowned at its base by a plate 53 fitted with holes 54 for the passage of fixing screws.

### Claims

1. Assembly for mounting sliding doors, comprising at least an upper carrying tubular track (1), a lower guiding device (6), carriages displaceable (2) in use along the track (1) and carriage retaining devices (5), each for releasably restraining the carriage (2) in a predetermined position; said track (1) having a substantially square cross-section and being open along one of its walls as per a central slot (7) internally limited by raceways (9) along which carriages (2) in use may travel; the sliding doors (4) being suspended from said carriages (2) using intermediate fastening elements (3), characterized in that the tubular track (1) has, on the wall opposite the open wall (11), a central internal longitudinal channel moulding (12) and two external longitudinal lateral flange portions (15), which channel moulding (12) externally forms a centrally protruding longitudinal portion (13), has on its bottom holes (14) for the passage of fixing screws and is sized so as to house the heads of such fixing screws; and which external flange portions (15) are located at either side of the centrally protruding portion (13), as an extension of the adjacent walls (16), and with a height equal to that of the aforementioned protruding portion (13), with which they define the track (1) resting surface; and in that the carriages (2) comprise a frame (17) having the form of a U-shaped profile, in the bottom face of which there is a central hole (18) in coincidence with which there is internally mounted an internally threaded hollow cylindrical member (19), on either side of which are fitted wheels (10) that protrude below through openings made in the bottom face of the frame (17) profile.
2. Assembly as per claim 1, characterized in that the axis (20) of the wheels (10) of the sliding door (4) suspension carriages (2) are fitted with external longitudinal groove (21) used to store lubricant.
3. Assembly as per claim 1, characterized in that each of the wheels (10) of the sliding door (4) suspension carriage (2) is made of an external plastic material frame (22), a metal hollow cylindrical member (23) coaxially fixed inside the aforementioned frame (22)

and two aligned hollow cylindrical members (24) fitted upon the axis (20) of the wheel (10), supporting each other using their adjacent edges and against the walls of the frame (17) through the external edges; the two aligned hollow cylindrical members (24) having, at their adjacent edges, conical offsets (25) defining an intermediate furrow, opposite to which the hollow cylindrical member (23) fixed to the frame (22) has another annular furrow (26) for the assembly of bearing balls (27) between both furrows (26).

4. Assembly as per claim 1, in which the intermediate sliding door (4) suspension fastening elements (3) include an U shaped profile (38) partially closed through the use of longitudinal wings which in use are in line with the upper edge of the sliding door (4), characterized in that inside the profile (38) is housed a Z shaped part (39) with parallel end branches (40,41), capable of sliding along the profile (38) and which rests upon the bottom of the profile (38) using one of the end branches (40) and, using the opposite end branch (41), upon the wings (42) that partially close said profile (39), having the previously mentioned latter branch (41) a hole for the passage of a screw (28) used to attach it to the hollow cylindrical member (19) of the displaceable carriages (2), which screw (28) has a polygonal head adjustable between the walls of the U shaped profile (38), so as to prevent it from turning, the U shaped profile (38) further having two internal end tops on its bottom surface, made up of the heads of the two screws (43) used to fix said profile (38) at either end, which limit the displacement of the Z shaped part (39).

5. Assembly as per claim 1, characterized in that the carriage retaining devices (5) are made of parts (44) shaped as an inverted U, located broadside, which side branches (45) run and support themselves perpendicularly upon the track sliding raceways (9) and further have, as from their free edge, notches (46) that may be housed upon the longitudinal ribs that protrude from said raceways (9), whereas the central part extends, from one of its edges, forming an arm (47) directed towards the inside of the track (1), fitted to its bottom and featuring on its lower surface a curve-concave longitudinal notch (48) to receive one of the wheels (10) of the adjacent carriage (2); its central part further fitted with a central hole (49) in which fits tightly a nut (50) on which is threaded a bolt (42') capable of resting its free end upon the ceiling of the track (1).

#### Patentansprüche

1. Anordnung bzw. Baugruppe zur Montage von

5 Schiebetüren, umfassend mindestens eine obere rohrförmige Schiene (1), eine untere Führungseinrichtung (6), bei Gebrauch entlang der Schiene (1) verschiebbare Schlitten (2) und Schlittenhaltevorrichtungen (5), wobei jeweils eine zum ausklinkbaren Zurückhalten des Schlittens (2) in einer zuvor bestimmten Position bestimmt ist, wobei die Schiene (1) einen im wesentlichen rechteckigen Querschnitt aufweist und entlang einer ihrer Wandungen einen zentralen Schlitz (7), der im Innern durch Kanäle (9) begrenzt ist, aufweist, entlang derer die Schlitten (2) bei Gebrauch bewegbar sind, wobei die Schiebetüren (4) an besagten Schlitten (2) mittels Zwischenbefestigungselementen (3) aufgehängt sind,  
**dadurch gekennzeichnet,**  
dass die rohrförmige Schiene (1) an der offenen Wandung (11) gegenüberliegender Wandung ein zentrales inneres Längskanalformteil (12) und zwei äußere Seitenflanschteilabschnitte (15) aufweist, wobei das Kanalformteil (12) außen einen zentralen vorspringenden Längsabschnitt (13) bildet, der auf seinem Boden Öffnungen (14) für den Durchtritt von Befestigungsschrauben aufweist, und das so dimensioniert ist, dass die Köpfe der Befestigungsschrauben abstützbar sind, wobei die äußeren Flanschabschnitte (15) sich zu beiden Seiten des zentral vorspringenden Abschnittes (13) jeweils als Verlängerung der benachbarten Wandungen (16) angebracht sind und eine Höhe aufweisen, die gleich der des zentralen vorspringenden Abschnitts (13) ist, wodurch die Abstützfläche der Schiene (1) bestimmt wird, und dass die Schlitten (2) einen Rahmen (17) in Form eines U-förmigen Profils aufweisen, in dessen Bodenfläche sich eine zentrale Öffnung (18) befindet, in Übereinstimmung mit welcher ein hohlylindrisches Element mit Innengewinde (19) im Innern befestigt ist, an dessen beiden Seiten Räder (10) befestigt sind, die unterhalb durch Öffnungen in der Bodenfläche des Rahmensprofils (17) hervorspringen.

2. Anordnung nach Anspruch 1,  
**dadurch gekennzeichnet,**  
dass die Achsen (20) der Räder (10) der Aufhängeschlitten (2) der Schiebetür (4) mit äußeren längs verlaufenden Nuten (21) zur Aufnahme von Schmiermittel versehen sind.

3. Anordnung nach Anspruch 1,  
**dadurch gekennzeichnet,**  
dass jedes der Räder (10) der Aufhängeschlitten (2) der Schiebetür (4) aus einem äußeren Rahmen aus Kunststoffmaterial (22), einem metallischen, hohlylindrischen Element (23), welches koaxial innerhalb des besagten Rahmens (22) befestigt ist, sowie aus zwei zueinander ausgerichteten hohlylindrischen Elementen (24) besteht, die auf der Achse

(20) des Rades (10) befestigt sind, die sich gegenseitig durch ihre aneinadergrenzenden Ränder und gegen die Wandungen des Rahmens (17) durch ihre äußereren Ränder stützen, wobei die beiden zu einander ausgerichteten hohlzylindrischen Elemente (24) an ihren aneinadergrenzenden Rändern konische Absätze (25) aufweisen, die eine Zwischenut bestimmen, gegenüber welcher das an dem Rahmen (22) befestigte hohlzylindrische Element (23) eine weitere ringförmige Nut (26) für die Anordnung von Kugellagern (27) zwischen beiden Nuten (26) aufweist.

4. Anordnung nach Anspruch 1, in welcher die Zwischenbefestigungselemente (3) der Schiebetür (4) ein U-förmiges Profil (38) einschließen, das teilweise durch die Verwendung von Längsflügeln, die bei Benutzung in einer Linie mit dem oberen Ende der Schwenktür (4) liegen, geschlossen ist, dadurch gekennzeichnet,  
dass sich innerhalb des Profils (38) ein Z-förmiges Teil (39) mit parallelen Endabschnitten (40, 41) befindet, das geeignet zum Verschieben entlang des Profils (38) ist und das mit einem der Endabschnitte (40) auf dem Boden des Profils (38) aufsitzt, und unter Benutzung des gegenüberliegenden Endabschnitts (41) über den Flügeln (42), die teilweise besagtes Profil (38) verschließen, besagter letzterer Endabschnitt (41) ein Loch für den Durchgang einer Schraube (28) aufweist, die dazu dient, diesen am hohlzylindrischen Element (19) des verschiebbaren Schlittens (2) zu befestigen, wobei die Schraube (28) einen polygonalen Kopf aufweist, der zwischen den Wandungen des U-förmigen Profils (38) einstellbar ist, um ein Drehen desselben zu verhindern, wobei das U-förmige Profil (28) darüber hinaus zwei innere obere Enden an seiner Bodenfläche aufweist, die aus den Köpfen der zwei Schrauben (43) bestehen, die zur Befestigung von besagtem Profil (38) an jedem Ende dienen, die das Verschieben des Z-förmigen Teils (39) begrenzen.

5. Anordnung nach Anspruch 1, dadurch gekennzeichnet,  
dass die Schlittenhaltevorrichtungen (5) aus Teilen (44) bestehen, die eine umgedrehte U-Form aufweisen und sich an der Breitseite befinden, wobei deren Seitenabschnitte (45) auf dem Schienenkanal (9) verlaufen und sich selbst senkrecht auf diesen stützen, und außerdem von ihrem freien Ende aus Einkerbungen (46) aufweisen, die sich auf den Längsrissen befinden, die von besagten Kanälen (9) vorspringen, an welchen sich der zentrale Teil erstreckt, der an einem seiner Enden einen Arm (47) bildet, der in das Innere der Schiene (1) gerichtet und an deren Boden befestigt ist und an seiner unteren Fläche eine langgstreckte, konkavgewölbte Einkerbung (48) aufweist, um eines der Räder

5 10 15 20 25 30 35 40 45 50 55

des benachbarten Schlittens (2) aufzunehmen, und wobei sein zentrales Teil des weiteren in einer zentralen Öffnung (49) befestigt ist, in der eine Mutter (50) fest befestigt ist, an der ein Bolzen (42') geschraubt ist, der mit seinem freien Ende auf der Decke der Schiene (1) aufsetzbar ist.

**Revendications**

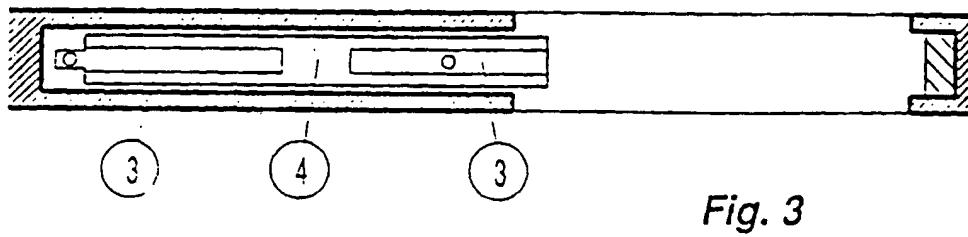
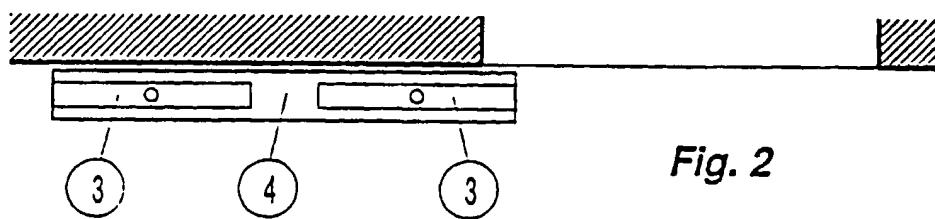
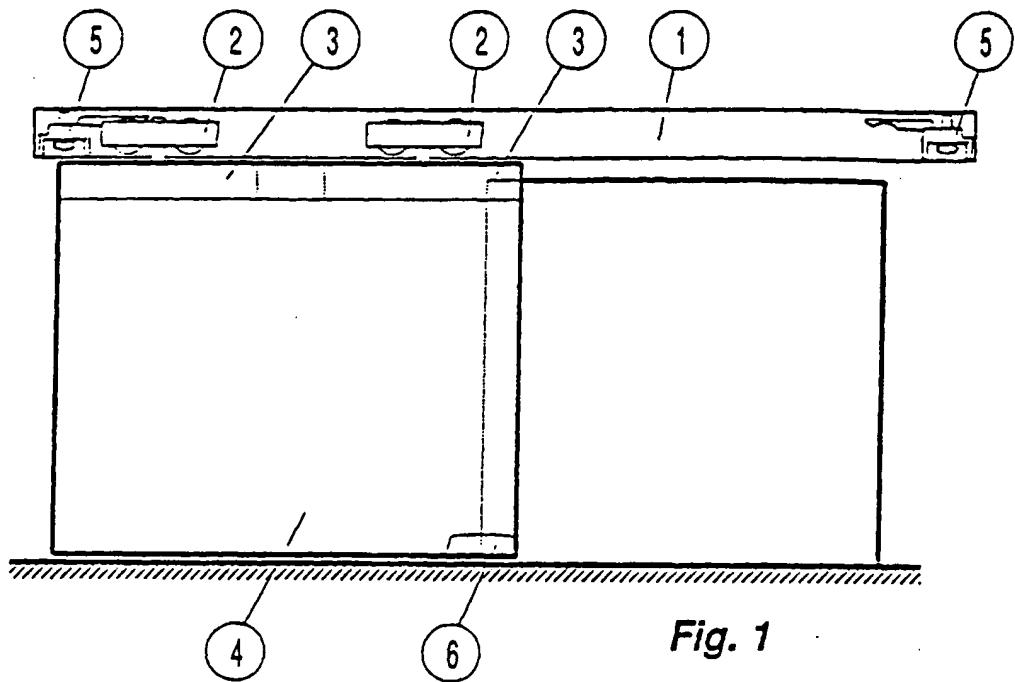
1. Ensemble de montage de portes coulissantes, comprenant au moins un rail tubulaire porteur supérieur (1), un dispositif de guidage inférieur (6), des chariots pouvant être déplacés (2) en utilisation le long du rail (1) et des dispositifs de retenue de chariot (5), chacun étant destiné à retenir de façon libérable le chariot (2) dans une position prédéterminée, ledit rail (1) présentant une section transversale pratiquement carrée et étant ouvert le long de l'une de ses parois suivant une fente centrale (7) limitée à l'intérieur par des chemins de roulement (9) le long desquels les chariots (2) peuvent se déplacer en utilisation, les portes coulissantes (4) étant suspendues à partir desdits chariots (2) en utilisant des éléments de fixation intermédiaires (3), caractérisé en ce que le rail tubulaire (1) comporte, sur la paroi opposée à la paroi ouverte (11), un moulage de canal longitudinal interne central (12) et deux parties de rebords latéraux longitudinaux externes (15), lequel moulage de canal (12) forme à l'extérieur une partie longitudinale saillante de façon centrale (13), comporte sur sa partie inférieure des trous (14) pour le passage de vis de fixation et est dimensionné de façon à loger les têtes de telles vis de fixation, et lesquelles parties de rebords externes (15) sont situées de chaque côté de la partie saillante de façon centrale (13), sous forme d'une extension des parois adjacentes (16), et avec une hauteur égale à celle de la partie saillante mentionnée précédemment (13), avec laquelle elles définissent la surface d'appui du rail (1), et en ce que les chariots (2) comprennent un châssis (17) ayant la forme d'un profilé en U, dans la face inférieure duquel se trouve un trou central (18) en coïncidence avec lequel est monté de façon interne un élément cylindrique creux (19) fileté de façon interne, de chaque côté duquel sont montées des roues (10) qui dépassent en dessous au travers d'ouvertures réalisées dans la face inférieure du profil de châssis (17).
2. Ensemble selon la revendication 1, caractérisé en ce que les axes (20) des roues (10) des chariots (2) de suspension de portes coulissantes (4) sont munis d'une cannelure longitudinale externe (21) utilisée pour stocker du lubrifiant.
3. Ensemble selon la revendication 1, caractérisé en

ce que chacune des roues (10) du chariot de suspension (2) de porte coulissante (4) est fait d'un châssis de matière plastique externe (22), d'un élément cylindrique creux métallique (23) fixé de façon coaxiale à l'intérieur du châssis mentionné précédemment (22) et de deux éléments cylindriques creux alignés (24) montés sur l'axe (20) de la roue (10), se supportant l'un à l'autre en utilisant les bords adjacents et contre les parois du châssis (17) au travers des bords extérieurs, les deux éléments cylindriques creux alignés (24) comportant au niveau de leurs bords adjacents, des déports coniques (25) définissant une gorge intermédiaire, à l'opposé de laquelle l'élément cylindrique creux (23) fixé au châssis (22) comporte une autre gorge annulaire (26) destinée au montage de billes (27) de roulement entre les deux gorges (26).

4. Ensemble selon la revendication 1, dans lequel les éléments (3) de fixation de suspension de porte coulissante (4) intermédiaires comprennent un profil en forme de U (38) partiellement refermé grâce à l'utilisation d'ailes longitudinales qui, en utilisation sont alignées avec le bord supérieur de la porte coulissante (4), caractérisé en ce qu'à l'intérieur du profil (38) est logée une partie en forme de Z (39) avec des branches d'extrémité (40, 41) parallèles, pouvant coulisser le long du profil (38) et qui reposent sur le fond du profil (38) en utilisant l'une des branches d'extrémité (40) et, en utilisant la branche d'extrémité opposée (41), sur les ailes (42) qui ferment partiellement ledit profil (39), cette dernière branche mentionnée précédemment (41) comportant un trou pour le passage d'une vis (28) utilisée pour le fixer à l'élément cylindrique creux (19) des chariots pouvant se déplacer (2), laquelle vis (28) comporte une tête polygonale ajustable entre les parois du profil en forme de U (38), de façon à l'empêcher de tourner, le profil en forme de U (38) comportant en outre deux sommets d'extrémité internes sur sa surface inférieure, constitués des têtes de deux vis (43) utilisées pour fixer ledit profil (38) à l'une ou l'autre extrémité, qui limitent le déplacement de la partie en forme de Z (39).

5. Ensemble selon la revendication 1, caractérisé en ce que les dispositifs de retenue de chariot (5) sont constitués de parties (44) en forme de U inversé, disposées en largeur, dont les branches latérales (45) courent et se supportent d'elles-mêmes perpendiculairement sur les chemins de roulement de coulissement du rail (9) et comportent en outre, à partir de leur bord libre, des encoches (46) qui peuvent être logées sur les nervures longitudinales qui dépassent desdits chemins de roulement (9), alors que la partie centrale s'étend, depuis l'un de ses bords, en formant un bras (47) dirigé vers l'intérieur du rail (1), monté sur sa partie inférieure et présen-

tant sur sa surface inférieure une encoche longitudinale à courbe concave (48), afin de recevoir l'une des roues (10) du chariot adjacent (2), sa partie centrale étant en outre munie d'un trou central (49) dans lequel s'adapte étroitement un écrou (50) sur lequel est vissé un boulon (42') dont l'extrémité libre peut reposer sur le dessus du rail (1).



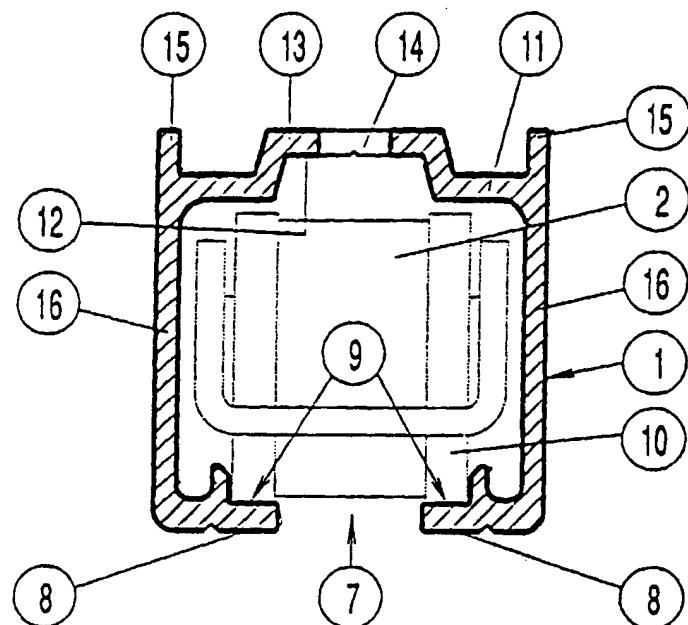


Fig. 4

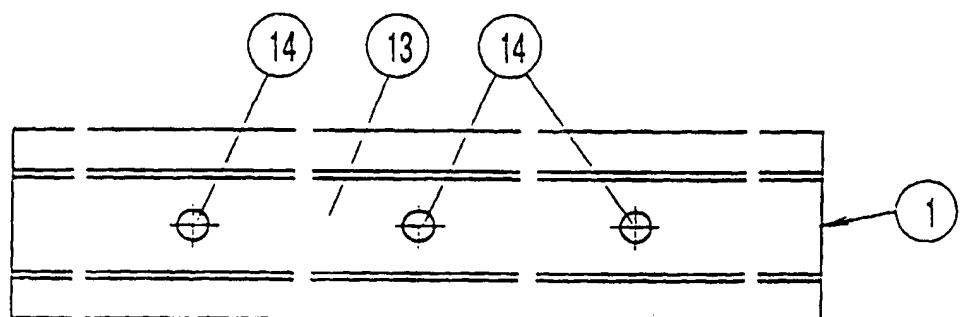
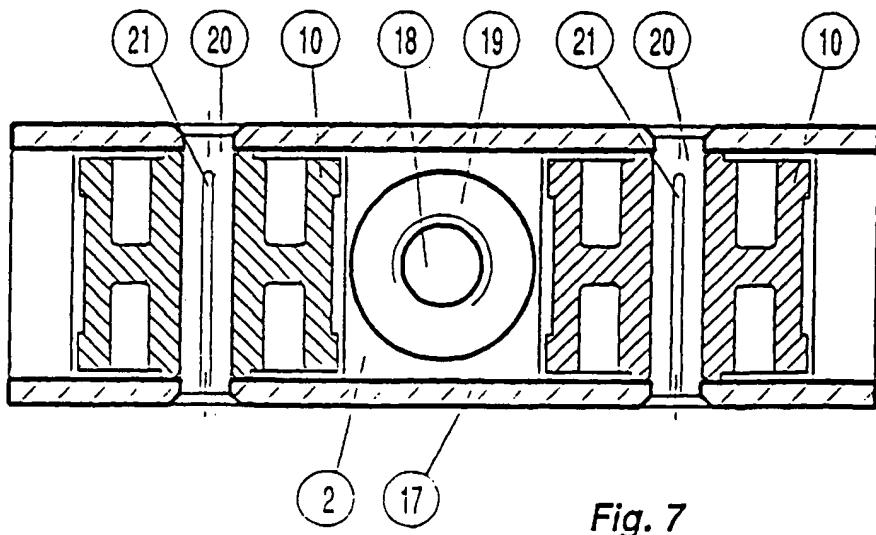
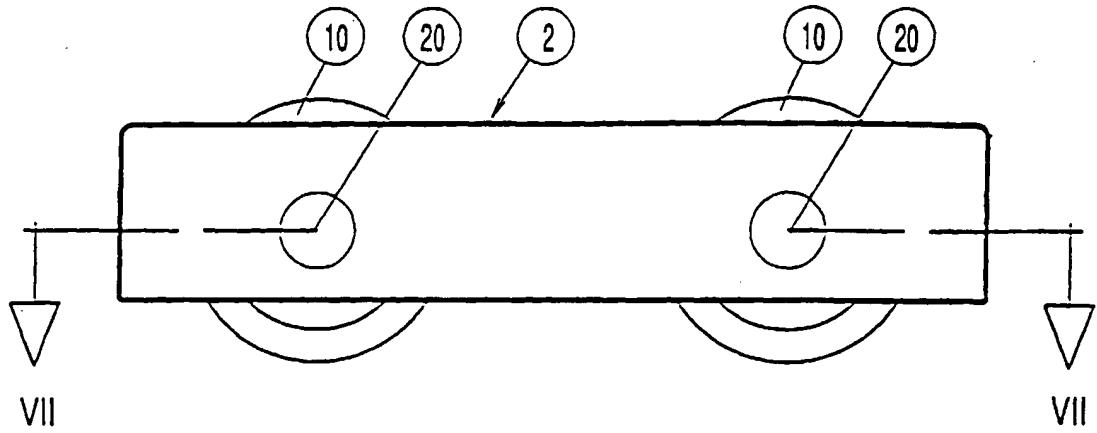
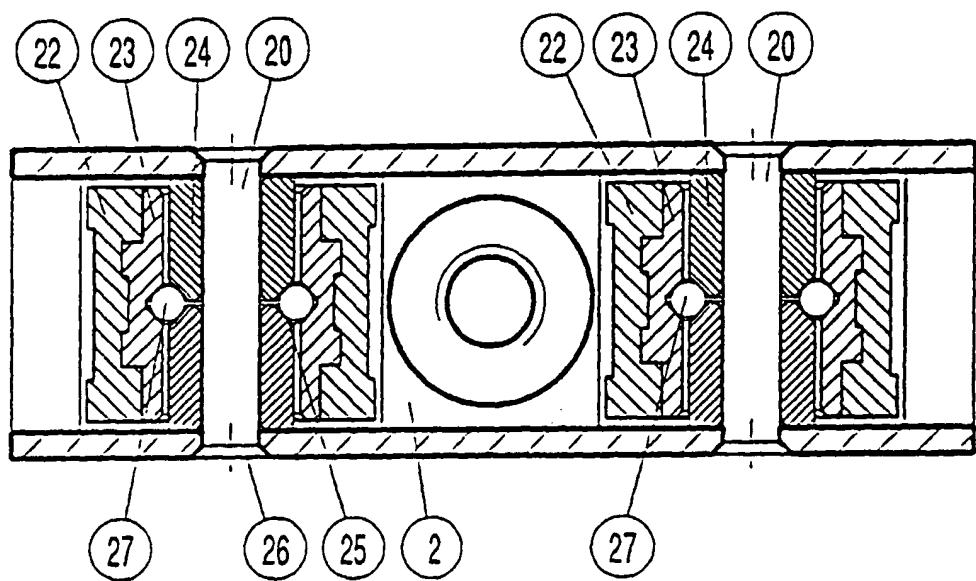
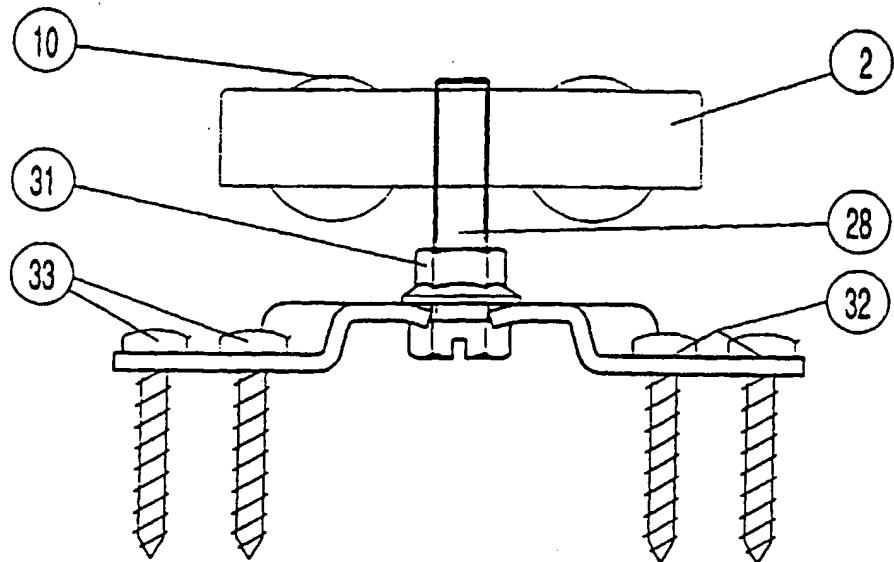


Fig. 5

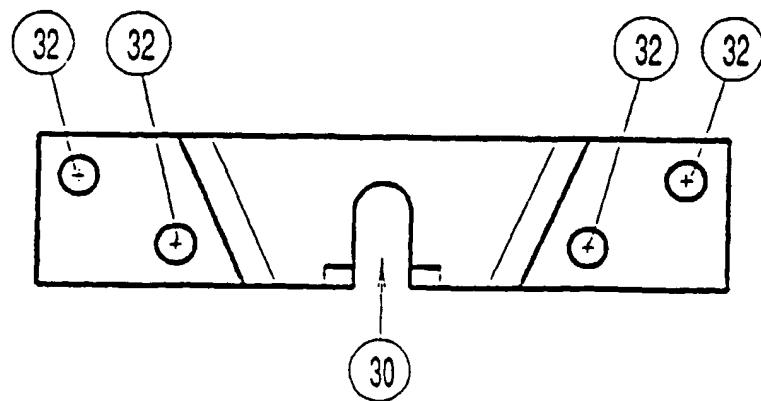




*Fig. 8*



*Fig. 9*



*Fig. 10*

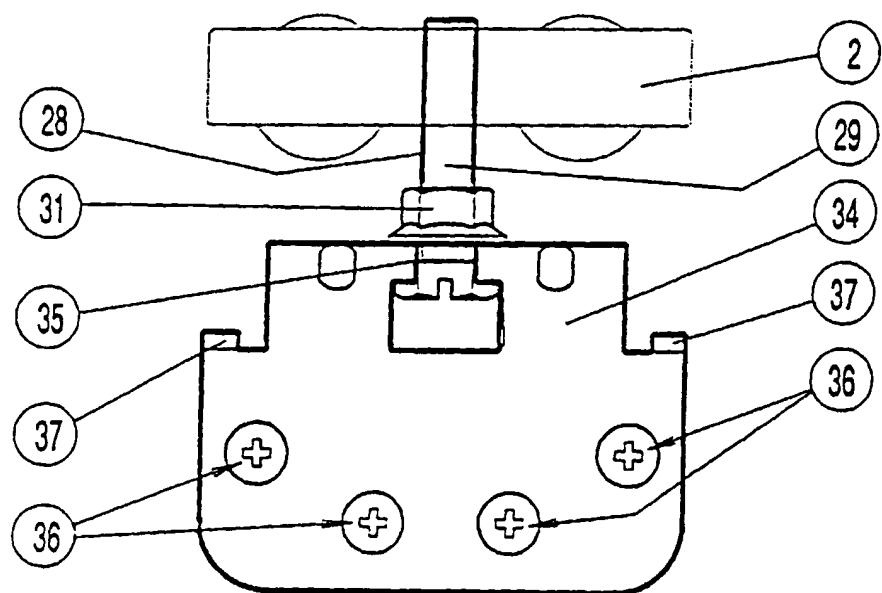
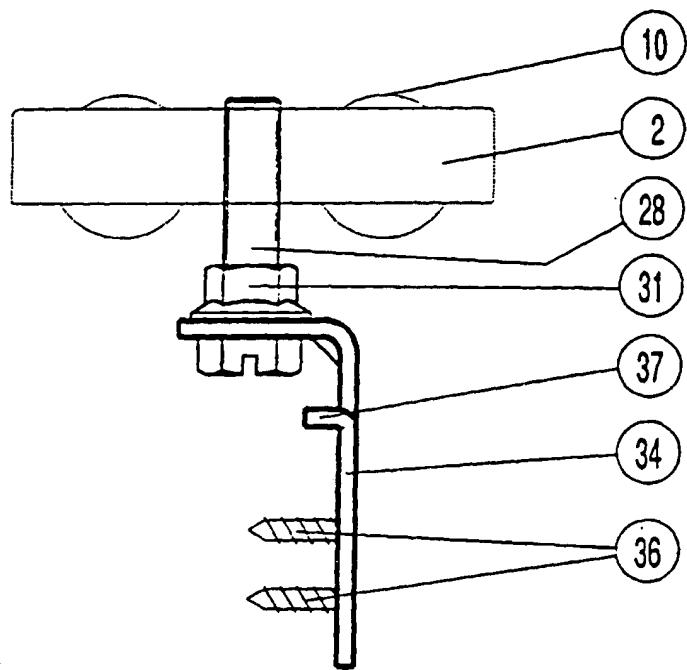


Fig. 11



*Fig. 12*

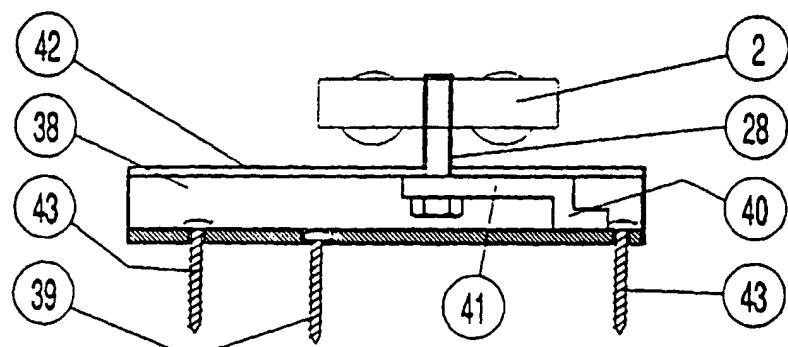


Fig. 13

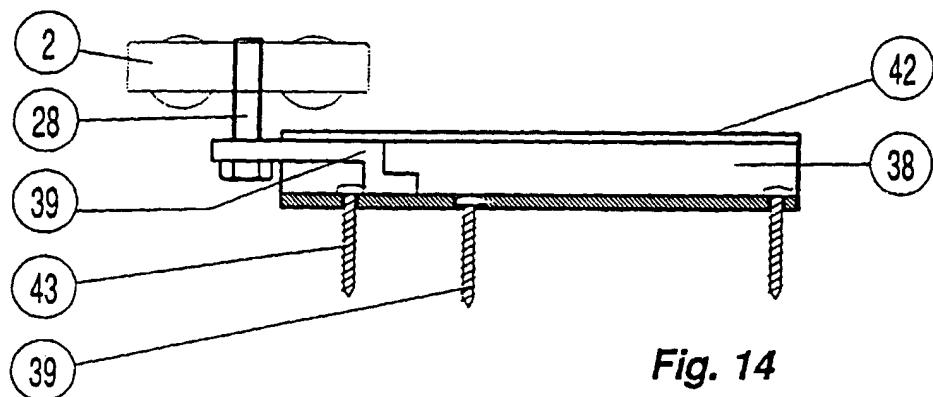


Fig. 14

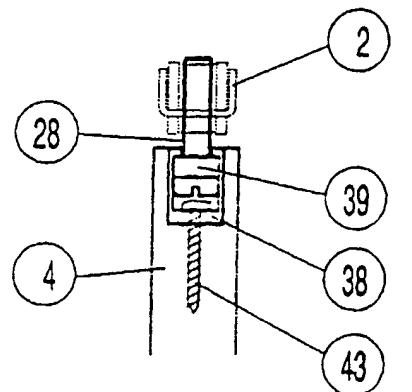


Fig. 15

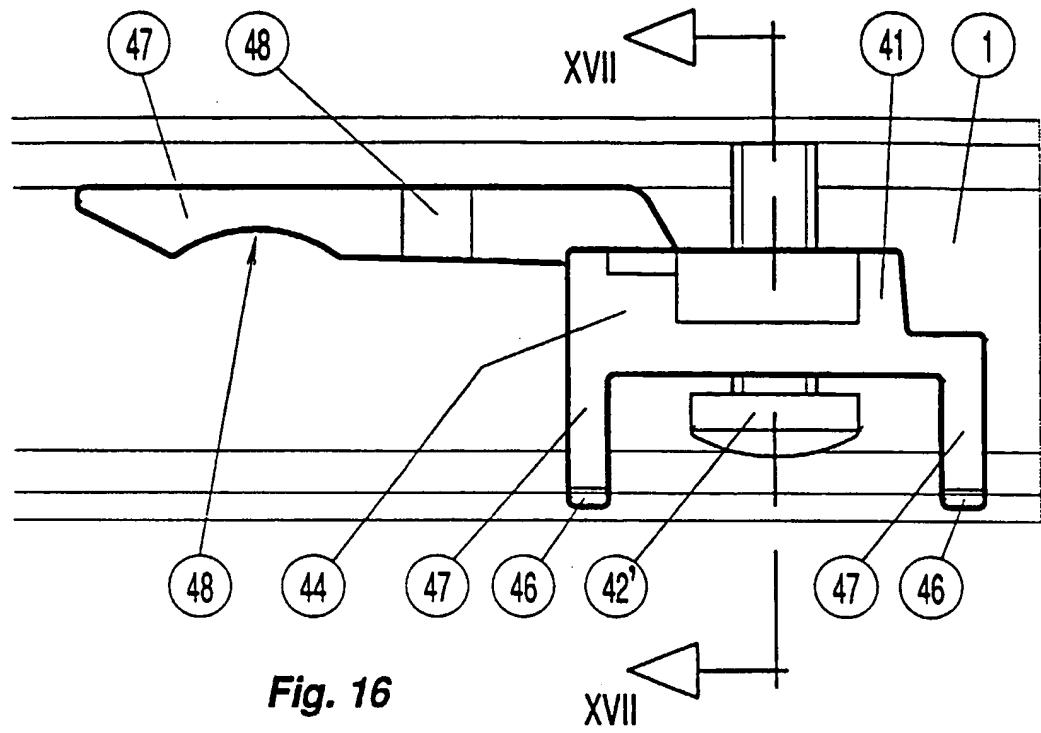


Fig. 16

XVII

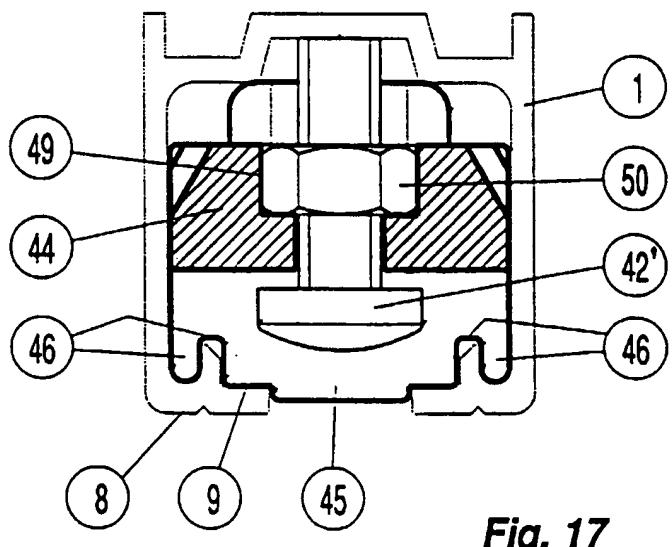
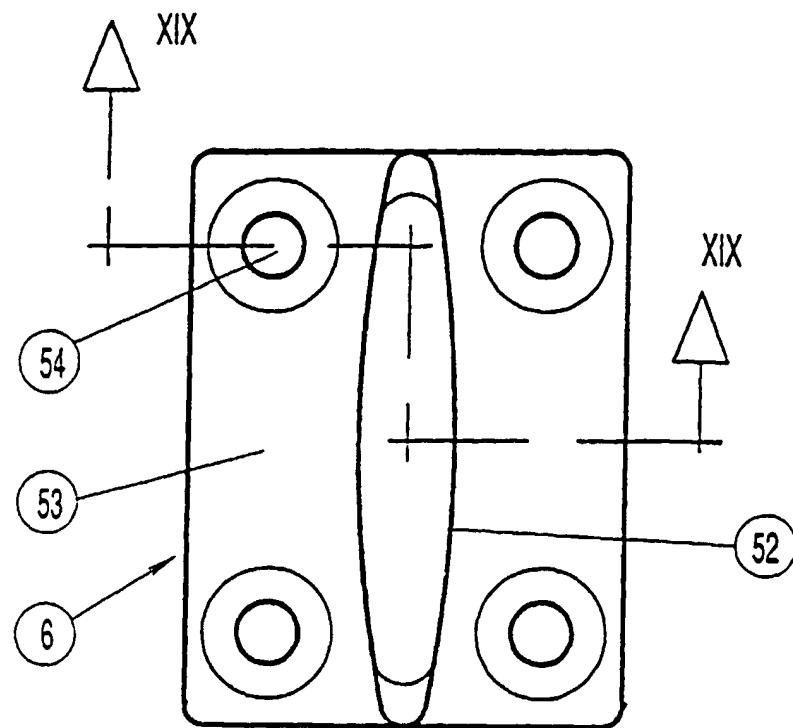
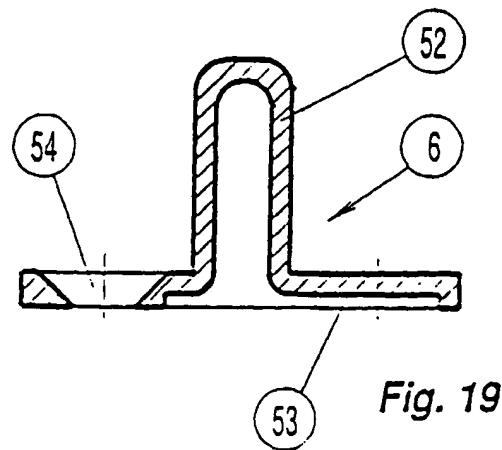


Fig. 17



*Fig. 18*



*Fig. 19*